

November 8, 2001

Larry Armstrong
Hill-Rom Company, Inc.
1069 Highway 46 East
Batesville, Indiana 47006

Re: Registered Construction and Operation Status,
127-14824-00014

Dear Mr. Armstrong.:

The application from Hill-Rom Company, Inc., received on September 4, 2001, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-5.5, it has been determined that the following architectural products manufacturing plant, to be located at 11 South Walnut, Batesville, Indiana 47006, Indiana, is classified as registered:

- (a) One (1) Binks spray booth, identified as EU-01, using an electrostatic air atomized application systems with dry filter for overspray control, coating a maximum of 16.0 hospital wall units per hour, and exhausting to one (1) stack identified as S/V #1.
- (b) One (1) touch-up paint area, identified as EU-02, using an aerosol application system, coating a maximum of 16.0 hospital wall units per hour, and exhausting through building vents.
- (c) Miscellaneous source wide clean-up operations, identified as EU-04, using maximum of 1.26 pounds per hour of clean-up solvents, and exhausting to one (1) stack identified as S/V #1.
- (d) Woodworking operations, identified as EU-05, processing a maximum of 22.0 wood panels per hour, with one (1) cyclone for particulate control, exhausting at one (1) stack identified as S/V #2.
- (e) Welding and cutting of steel operation, identified as IA-02, and exhausting through building vents.
- (f) Twenty four (24) natural gas fired space heaters with a total heat input of 1.6 MMBtu/hr identified as IA-03.
- (g) Water and oil based cutting coolants, identified as IA-04, and exhausting through building vents.

The following conditions shall be applicable:

1. Pursuant to 326 IAC 5-1-2 (Opacity Limitations) except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following:
 - (a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
 - (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of

15 minutes (60 readings) in a 6-hour period as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor in a six (6) hour period.

2. Pursuant to 326 IAC 6-3-2 (Process Operations)

- (a) Pursuant to 326 IAC 6-3-2, the particulate matter (PM) from the woodworking operations (EU-05) shall not exceed 3.9 lb/hr and shall be limited by the equation given in subpart (e).
- (b) The cyclone shall be in operation at all times the woodworking operation (EU-05) is in operation, in order to comply with this limit.
- (c) Pursuant to 326 IAC 6-3-2, the particulate matter (PM) from the surface coating operations (EU-01) shall be limited by the equation given in subpart (e).
- (d) The dry filter shall be in operation at all times the surface coating operation (EU-01) is in operation, in order to comply with this limit.
- (e) Interpolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 4.10 P^{0.67} \quad \text{where } E = \text{rate of emission in pounds per hour and} \\ P = \text{process weight rate in tons per hour}$$

- 3. Any change or modification of any VOC emitting unit resulting in an increase of VOC emissions to 25 tons/yr or greater must be approved by the Office of Air Quality (OAQ) before such change may occur.

This registration is issued for the entire source, and shall supersede Federal Enforceable State Operating Permit (FESOP) issued on December 11, 1996 and its amendment issued on July 7, 2000. The source shall operate according to 326 IAC 2-5.5.

An authorized individual shall provide an annual notice to the Office of Air Quality that the source is in operation and in compliance with this registration pursuant to 326 IAC 2-5.5-4(a)(3). The annual notice shall be submitted to:

**Compliance Data Section
Office of Air Quality
100 North Senate Avenue
P.O. Box 6015
Indianapolis, IN 46206-6015**

no later than March 1 of each year, with the annual notice being submitted in the format attached.

An application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Quality (OAQ) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

Sincerely,

Original signed by Paul Dubenetzky

Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

GAS

cc: File - Ripley County
Ripley County Health Department
Air Compliance - Joe Foyst
Permit Tracking - Cynthia Baymaster
Technical Support and Modeling - Michele Boner
Compliance Data Section - Karen Nowak

Registration Annual Notification

This form should be used to comply with the notification requirements under 326 IAC 2-5.5-4(a)(3)

Company Name:	Hill-Rom Company, Inc.
Address:	11 South walnut
City:	Batesville, Indiana 47006
Authorized individual:	
Phone #:	
Registration #:	

I hereby certify that Hill-Rom Company, Inc. is still in operation and is in compliance with the requirements of Registration 127-14824-00014.

Name (typed):
Title:
Signature:
Date:

Indiana Department of Environmental Management Office of Air Quality

Technical Support Document (TSD) for a Registration

Source Background and Description

Source Name: Hill-Rom Company Architectural Products Plant
Source Location: 11 South walnut, Batesville, Indiana 47006
County: Ripley
SIC Code: 2599
Operation Permit No.: 127-14824-00014
Permit Reviewer: Ghassan Shalabi

The Office of Air Quality (OAQ) has reviewed an application from Hill-Rom Company Architectural Products Plant relating to the construction and operation of an architectural products manufacturing plant.

Permitted Emission Units and Pollution Control Equipment

The source consists of the following permitted emission units and pollution control devices:

- (a) One (1) Binks spray booth, identified as EU-01, using an electrostatic air atomized application systems with dry filter for overspray control, coating a maximum of 16.0 hospital wall units per hour, and exhausting to one (1) stack identified as S/V #1.
- (b) One (1) touch-up paint area, identified as EU-02, using an aerosol application system, coating a maximum of 16.0 hospital wall units per hour, and exhausting through building vents.
- (c) Miscellaneous source wide clean-up operations, identified as EU-04, using maximum of 1.26 pounds per hour of clean-up solvents, and exhausting to one (1) stack identified as S/V #1.
- (d) Woodworking operations, identified as EU-05, processing a maximum of 22.0 wood panels per hour, with one (1) cyclone for particulate control, exhausting at one (1) stack identified as S/V #2.
- (e) Welding and cutting of steel operation, identified as IA-02, and exhausting through building vents.
- (f) Twenty four (24) natural gas fired space heaters with a total heat input of 1.6 MMBtu/hr identified as IA-03.
- (g) Water and oil based cutting coolants, identified as IA-04, and exhausting through building vents.

Unpermitted Emission Units and Pollution Control Equipment

There are no unpermitted facilities operating at this source during this review process.

Existing Approvals

The source has been operating under previous approvals including, but not limited to, the following:

- (a) F 137-5564-00014, issued on December 11, 1996;
- (b) CP 137-10162-00014, issued on October 7, 1998.
- (c) F 137-12301-00014, issued on July 7, 2001

This registration is issued for the entire source, and shall supersede the conditions of the permits mentioned above.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
V#1	Spray booth and clean-up operation	55	3.5	25,000	Ambient
V#2	Woodworking operations	15	1.5	5-10,000	Ambient
Building Vents*	Touch-up paint, IA-02, IA-03, etc.	Varies	Varies	NA	Ambient

* Represents building vents or any other equivalent opening which act as release points for the indoor fugitive emissions.

Enforcement Issue

There are no enforcement actions pending.

Recalculated Source Potential to Emit (PTE)

This source was issued a Federally Enforceable State Operating Permit (FESOP) on December 11, 1996. This FESOP was administratively amended on July 7, 2000. The facility has switched to only water-based paint in its paint booth identified as EU-01 and has changed paint in the touch-up paint area identified as EU-02. The facility has eliminated one of the three solvents used in its wide clean-up operations identified as EU-04. These changes have reduced the source's PTE to levels less than those requiring a Title V or FESOP (See Appendix A of this document for detailed emissions calculations (2 pages)). Hill-Rom Company has requested, and the OAQ agrees that this registration should be issued for the entire source, and should supersede the conditions of the FESOP issued on December 11, 1996 and its amendment issued on July 7, 2000. There are no new facilities being constructed as part of this registration.

Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

A complete application for the purposes of this review was received on September 04, 2001.

Emissions Calculations

See Appendix A (Emissions Calculation Spreadsheets) for detailed calculations (7 pages).

Potential To Emit

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, the department, or the appropriate local air pollution control agency.”

Pollutant	Potential To Emit (tons/year)
PM	21.513
PM-10	21.55
SO ₂	-
VOC	23.43
CO	-
NO _x	-

HAP's	Potential To Emit (tons/year)
Glycol Ether	1.15
Xylene	0.01
Toluene	0.16
MEK	0.07
Other	0.0133
TOTAL	1.40

- (a) The potential to emit (as defined in 326 IAC 2-5.5-1(b)(1)) of PM, PM-10, and VOC are less than twenty-five (25) tons per year and equal to or greater than five (5) tons per year for PM and PM-10 and greater than five (10) tons per year For VOC. Therefore, the source is subject to the provisions of 326 IAC 2-5.5-1.
- (b) The potential to emit (as defined in 326 IAC 2-4.1-1 and 40 CFR 63.41) of any single HAP is equal to or greater than ten (10) tons per year and/or the potential to emit (as defined in 326 IAC 2-4.1-1 and 40 CFR 63.41) of a combination HAPs is greater than or equal to twenty-five (25) tons per year. Therefore, this source is not a major source of hazardous air pollutants.

Actual Emissions

No previous emission data has been received from the source.

County Attainment Status

The source is located in Ripley County.

Pollutant	Status
PM-10	Attainment
SO ₂	Attainment
NO ₂	Attainment
Ozone	Attainment
CO	Attainment
Lead	Attainment

- (a) Volatile organic compounds (VOC) and oxides of nitrogen (NOx) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Ripley County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) Ripley County has been classified as attainment or unclassifiable for PM-10, SO₂, NO₂, CO and Lead. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This existing source has been issued a FESOP (F 137-5564-00014) on December 11, 1996. This registration shall supersede the conditions of the FESOP.

326 IAC 2-7 (Part 70 Permit Program)

This existing source is no longer subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) each criteria pollutant is less than 100 tons per year,
- (b) a single hazardous air pollutant (HAP) is less than 10 tons per year, and
- (c) any combination of HAPs is less than 25 tons/year.

This status is based on calculations performed based application submitted on September 4, 2001.

Federal Rule Applicability

- (a) The spray booth (EU-01) is subject to the New Source Performance Standard, 326 IAC 12, (40 CFR 60.310, Subpart EE). This rule applies to affected facilities constructed after November 28, 1980, engaging in surface coating of metal furniture, which use more than 1,015 gal/yr of coating, as applied. The spray booth (EU-01) was constructed after November 28, 1980 and have potential usage of coatings greater than 1,015 gal/yr. Per 40 CFR Part 60.312, no owner or operator shall cause the discharge into the atmosphere of volatile organic compounds (VOC) emissions from any affected metal furniture surface coating operation in excess of 7.5 lb/gal of coating solids. The spray booth (EU-01) uses a coating with a 4.71lb/gal of solids content, and will therefore comply with this rule.
- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR art 63) applicable to this source.

State Rule Applicability - Entire Source

326 IAC 5-1 (Opacity Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

- (a) Opacity shall not exceed an average of forty percent (40%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

State Rule Applicability - Individual Facilities

326 IAC 6-3-2 (Process Operations)

- (a) The woodworking operations (EU-05) are subject to particulate matter limitations under 326 IAC 6-3-2. Pursuant to this rule, the particulate matter (PM) from the woodworking operations (EU-05) shall be limited by the following:

Interpolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 4.10 P^{0.67} \quad \text{where } E = \text{rate of emission in pounds per hour and} \\ P = \text{process weight rate in tons per hour} \\ = 22 \text{ sheets/hr} * 84 \text{ lb/sheet} * (1 \text{ ton}/2,000 \text{ lb}) = 0.942 \text{ t/hr} \\ E = 4.10 (0.942^{0.67}) = 3.9 \text{ lb/hr} = 17.0 \text{ tons/yr}$$

The cyclone shall be in operation at all times the woodworking operation (EU-05) is in operation, in order to comply with this limit.

- (b) The surface coating operations (EU-01) are subject to particulate matter limitations under 326 IAC 6-3-2. Pursuant to this rule, the particulate matter (PM) from the surface coating operations (EU-01) shall be limited by the following:

Interpolation and extrapolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 4.10 P^{0.67} \quad \text{where } E = \text{rate of emission in pounds per hour and} \\ P = \text{process weight rate in tons per hour}$$

The dry filter shall be in operation at all times the surface coating operation (EU-01) is in operation, in order to comply with this limit.

326 IAC 8-2-6 (Metal Furniture Coating Operations) and 326 IAC 8-2-9 (Miscellaneous Metal Coating)

326 IAC 8-2-6 applies to facilities, located in Ripley County, constructed after January 1, 1980 (but before July 1, 1990) which engage in metal furniture surface coating, and have potential VOC emissions of greater than or equal to 25 ton/yr. The coating booth (EU-01) and touch-up paint area (EU-02) were constructed in 1984 and the potential emissions of any single facility at the source is less than twenty five (25) tons per year of VOC. Therefore non of these facilities is subject to this rule.

326 IAC 8-2-9 applies to facilities, located in Ripley County, constructed after November 1, 1980 (but before July 1, 1990) which engage in miscellaneous metal coating operations, and have potential VOC emissions of greater than or equal to 25 ton/yr. The coating booth (EU-01) and touch-up paint area (EU-02) were constructed in 1984 and the potential emissions of any single facility at the source is less than twenty five (25) tons per year of VOC. Therefore non of these facilities is subject to this rule.

Air Toxic Emissions

Indiana presently requests applicants to provide information on emissions of the 188 hazardous air pollutants (HAPs) set out in the Clean Air Act Amendments of 1990. These pollutants are either carcinogenic or otherwise considered toxic and are commonly used by industries. They are listed as air toxics on the Office of Air Quality (OAQ) Construction Permit Application Form Y.

- (a) This source will emit levels of air toxics less than those which constitute a major source according to Section 112 of the 1990 Clean Air Act Amendments.
- (b) See attached calculations for detailed air toxic calculations (7 pages).

Conclusion

The construction and operation of this architectural products manufacturing plant shall be subject to the conditions of the attached proposed Registered Construction and Operation Permit 127-14824-00014.

**Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations**

Company Name: Hill-Rom Company
Address City IN Zip: 11 South Walnut, Batesville, In 47006
CP: 127-14824
Plt ID: 127-00014
Reviewer: Ghassan Shalabi
Date: 9-26-2001

Material	Density (Lb/Gal)	Weight % Volatile (H2O & Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Volatiles (solids)	Gal of Mat. (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential (ton/yr)	lb VOC/gal solids	Transfer Efficiency
	10.0	61.06%	50.3%	10.8%	60.1%	26.91%	0.77900	5.000	2.68	1.07	4.17	100.17	18.28	16.52	3.98	75%
	10.0	61.50%	49.3%	12.2%	59.2%	25.96%	0.72000	5.000	3.00	1.22	4.40	105.60	19.27	15.19	4.71	75%
	9.8	59.82%	49.9%	9.9%	58.9%	28.44%	0.73700	5.000	2.36	0.97	3.58	85.89	15.68	15.94	3.41	75%
	6.4	84.33%	0.0%	84.3%	37.0%	17.00%	0.00500	5.000	8.57	5.40	0.13	3.24	0.59	0.03	31.75	75%
	8.8	76.00%	0.0%	76.0%	0.0%	24.00%	1.00000	0.004	6.68	6.68	0.03	0.64	0.12	0.01	27.84	75%
	6.6	100.00%	0.0%	100.0%	0.0%	0.00%	1.00000	0.069	6.58	6.58	0.45	10.90	1.99	0.00	ERR	75%
	10.0	61.50%	49.3%	12.2%	59.2%	25.96%	0.00076	216.000	3.00	1.22	0.20	4.78	0.87	1.65	4.71	40%
	0.0	0.00%	0.0%	0.0%	0.0%	0.00%	0.00000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	ERR	0%
	0.0	0.00%	0.0%	0.0%	0.0%	0.00%	0.00000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	ERR	0%
	0.0	0.00%	0.0%	0.0%	0.0%	0.00%	0.00000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	ERR	0%
	0.0	0.00%	0.0%	0.0%	0.0%	0.00%	0.00000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	ERR	0%

Add worst case coating to all solvents

5.21 125.17 22.84 18.21

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) * Weight % Organics) / (1-Volume % water)

Pounds of VOC per Gallon Coating = (Density (lb/gal) * Weight % Organics)

Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr)

Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (24 hr/day)

Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (8760 hr/yr) * (1 ton/2000 lbs)

Particulate Potential Tons per Year = (units/hour) * (gal/unit) * (lbs/gal) * (1- Weight % Volatiles) * (1-Transfer efficiency) *(8760 hrs/yr) *(1 ton/2000 lbs)

Pounds VOC per Gallon of Solids = (Density (lbs/gal) * Weight % organics) / (Volume % solids)

Total = Worst Coating + Sum of all solvents used

Page 2 of 7

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Appendix A: Emissions Calculations**Natural Gas Combustion Only****MM BTU/HR <100****Small Industrial Boiler**

Company Name: Hill-Rom Company

Address City IN Zip: 11 South Walnut, Batesville, In 47006

CP: 127-14824

Plt ID: 127-00014

Reviewer: Ghassan Shalabi

Date: 9-26-2001

Heat Input Capacity
MMBtu/hrPotential Throughput
MMCF/yr

1.6

14.0

Pollutant						
Emission Factor in lb/MMCF	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0	5.5	84.0
				**see below		
Potential Emission in tons/yr	0.01	0.05	0.00	0.70	0.04	0.59

*PM emission factor is filterable PM only. PM10 emission factor is condensable and filterable PM10 combined.

**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

Methodology

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

Note: Check the applicable rules and test methods for PM and PM10 when using the above emission factors to confirm that the correct factor is used (i.e., condensable included/not included).

See page 2 for HAPs emissions calculations.

gasc99.wb3

updated 4/99

Appendix A: Emissions Calculations**Natural Gas Combustion Only****MM BTU/HR <100****Small Industrial Boiler****HAPs Emissions**

Company Name: Hill-Rom Company

Address City IN Zip: 11 South Walnut, Batesville, In 47006

CP: 127-14824

Plt ID: 127-00014

Reviewer: Ghassan Shalabi

Date: 9-26-2001

HAPs - Organics

Emission Factor in lb/MMcf	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential Emission in tons/yr	1.472E-05	8.410E-06	5.256E-04	1.261E-02	2.383E-05

HAPs - Metals

Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	3.504E-06	7.709E-06	9.811E-06	2.663E-06	1.472E-05

Methodology is the same as page 1.

The five highest organic and metal HAPs emission factors are provided above.

Additional HAPs emission factors are available in AP-42, Chapter 1.4.

Company Hill-Rom Company

Address Ci 11 South Walnut, Batesville, In 47006

CP: 127-14824

Plt ID: 127-00014

Reviewer: Ghassan Shalabi

Date: 9-26-2001

Unit IA-04						
Metal Cutting coolant						
	VOC lb/gal	Flash-off %	Capacity gal/hr	PTE VOC lb/hr	PTE VOC t/yr	VOC
Aqueous Coolants (2) (dobois 200)	0	100%	0.7	0	0	0
Heavy oil coolants (Missile Lube #1)	0	100%	0.4	0	0	0
Medium oil coolants (Lubricoolant 930)	0	100%	0.3	0.126	0.55	
Total					0.55 t/yr	

Appendix A: Emissions Calculations
Welding and Thermal Cutting

Page 6 of 7 TSD App A

Company Name: Hill-Rom Company
Address City IN Zip: 11 South Walnut, Batesville, IN 47006
CP: 127-14824
Plt ID: 127-00014
Reviewer: Ghassan Shalabi
Date: 9/26/2001

PROCESS	Number of Stations	Max. electrode consumption per station (lbs/hr)		EMISSION FACTORS* (lb pollutant/lb electrode)				EMISSIONS (lbs/hr)				HAPS (lbs/hr)
				PM = PM10	Mn	Ni	Cr	PM = PM10	Mn	Ni	Cr	
WELDING												
Submerged Arc	0	0		0.036	0.011			0.000	0.000	0.000	0	0.000
Metal Inert Gas (MIG)(carbon steel)	2	0.071		0.0055	0.0005			0.001	0.000	0.000	0	0.000
Stick (E7018 electrode)	0	0		0.0211	0.0009			0.000	0.000	0.000	0	0.000
Tungsten Inert Gas (TIG)(carbon steel)	0	0		0.0055	0.0005			0.000	0.000	0.000	0	0.000
Oxyacetylene(carbon steel)	0	0		0.0055	0.0005			0.000	0.000	0.000	0	0.000
FLAME CUTTING	Number of Stations	Max. Metal Thickness Cut (in.)	Max. Metal Cutting Rate (in./minute)	EMISSION FACTORS (lb pollutant/1,000 inches cut, 1" thick)**				EMISSIONS (lbs/hr)				HAPS (lbs/hr)
				PM = PM10	Mn	Ni	Cr	PM = PM10	Mn	Ni	Cr	
Oxyacetylene	0	0	15	0.1622	0.0005	0.0001	0.0003	0.000	0.000	0.000	0.000	0.000
Oxymethane	0			0.0815	0.0002		0.0002	0.000	0.000	0.000	0.000	0.000
Plasma**	0	0	150	0.0039				0.000	0.000	0.000	0.000	0.000
EMISSION TOTALS												
Potential Emissions lbs/hr								0.0008				0.0001
Potential Emissions lbs/day								0.0187				0.0017
Potential Emissions tons/year								0.0034				0.0003

METHODOLOGY

*Emission Factors are default values for carbon steel unless a specific electrode type is noted in the Process column.

**Emission Factor for plasma cutting from American Welding Society (AWS). Trials reported for wet cutting of 8 mm thick mild steel with 3.5 m/min cutting speed (at 0.2 g/min emitted). Therefore, the emission factor for plasma cutting is for 8 mm thick rather than 1 inch, and the maximum metal thickness is not used in calculating the emissions.

Using AWS average values: (0.25 g/min)/(3.6 m/min) x (0.0022 lb/g)/(39.37 in./m) x (1,000 in.) = 0.0039 lb/1,000 in. cut, 8 mm thick
Plasma cutting emissions, lb/hr: (# of stations)(max. cutting rate, in./min.)(60 min./hr.)(emission factor, lb. pollutant/1,000 in. cut, 8 mm thick)
Cutting emissions, lb/hr: (# of stations)(max. metal thickness, in.)(max. cutting rate, in./min.)(60 min./hr.)(emission factor, lb. pollutant/1,000 in. cut, 1" thick)
Welding emissions, lb/hr: (# of stations)(max. lbs of electrode used/hr/station)(emission factor, lb. pollutant/lb. of electrode used)
Emissions, lbs/day = emissions, lbs/hr x 24 hrs/day
Emissions, tons/yr = emissions, lb/hr x 8,760 hrs/year x 1 ton/2,000 lbs.
Welding and other flame cutting emission factors are from an internal training session document.
Refer to AP-42, Chapter 12.19 for additional emission factors for welding.

welding.wk4 (11/99)

Appendix A: Emissions Calculations

Page 7 of 7

Company Name: Hill-Rom Company
Address City IN Zip: 11 South Walnut, Batesville, In 47006
CP: 127-14824
Plt ID: 127-00014
Reviewer: Ghassan Shalabi
Date: 9-26-2001

Total Emissions

	PM	PM-10	SO2	NOx	VOC	CO
Surface Coating	18.21	18.21	0	0	22.84	0
Woodwork operation	3.29	3.29	0	0	0	0
Space heaters	0.01	0.05	0	0.7	0.04	0.59
Welding	0.003	0	0	0	0	0
Medium oil coolants	0	0	0	0	0.55	0
Total	21.513	21.55	0	0.7	23.43	0.59